

Environmental Attitudes of Agricultural Science Teachers in Nigeria

Rasheed Adekunle FASASI

*School of Education
National Open University of Nigeria, Nigeria
rafasasi@yahoo.com*

Abstract

Teachers are rightly positioned to serve as motivating forces in the development of attitudes needed in achieving environmental goals and objectives. Their disposition often influences what they teach which equally has the potential of influencing learners' attitudes. This study, therefore, investigated the environmental attitude of Agricultural Science teachers in Nigeria and factors influencing it. It also identified their sources of environmental information. The sample consists of 87 teachers. A duly validated instrument named Agricultural Science Teachers' Environmental Attitude Scale [$r = 0.73$] was used for data collection. The study reveals that a combination of sources is the teachers' major source of environmental information. It also reveals that the teachers exhibit fairly positive attitude towards environmental problems and issues. Findings further show that male teachers have higher mean score ($\bar{X} = 56.59$) in environmental attitude than their female colleagues ($\bar{X} = 54.82$). The difference is, however, not significant ($t_{85} = 1.462, p > .001$). A non-significant difference was also identified with respect to the respondents' years of teaching. More seminars, for better exposure of Agricultural Science teachers to the implications of environmental problems and issues, among others, were recommended. It is concluded that gender and years of teaching are not enough to bring out positive environmental attitudes in Agricultural Science teachers, and that there is the need to conduct a research into other factors that may be responsible.

Keywords: *Agricultural Science Teachers, Environmental Attitude, Gender, Teaching Experience*

1. Introduction

In 1989, UNESCO-UNEP recommended that environmental literacy, which encompasses environmental knowledge, attitudes and skills, was critical to empowering whole populations to tackle environmental problems [1]. This position was informed by the urgent need for a reversal of the continuous and rapid deterioration of the environment by the activities of man.

Nigeria, taking a cue from the position of UNESCO-UNEP, adopted a National Conservation Education Strategy (NCES) in 1990 through the National Council on Education (NCE). This position is also in line with UN Conference on Environment and Development (UNCED) guideline of 1992 which empowered International Environmental Education Programme (IEEP) to re-orient education towards a sustainable development. The NCE, therefore, directed that elements of environmental education be infused in all school subjects at all levels. This stand was based on the premise that environmental problems were essentially multi-disciplinary in nature and thus could not be subsumed within a single field of knowledge [UNESCO 2; Okpala 3]. It then became the responsibility of the National Educational Research and Development Council

(NERDC) to integrate environmental education components into existing school subjects. A prototype environmental education curriculum was therefore developed, which focused on the integration of environmental education components into junior and secondary school subjects (NERDC/UNESCO 4; Adara 5).

In a critical analysis of the prototype, Mansaray, Ajiboye and Audu [6] noted that what seemed apparent in the integration exercise was that the broad spectrums of the school subjects vary in capacity to absorb the salient environmental education components. Benton [7] had earlier concluded that some subjects would appear to be more accommodating of the components than others. Fasasi [8] identified Agricultural Science as one of such subjects. The effective integration and learning of environmental concepts in Agricultural Science curricula in secondary schools would therefore be of immense benefit in the creation of necessary awareness of environmental problems to learners and consequently bring about the desired change in their environmental attitude. To achieve this, both the learner and the teacher must be symbols of the change that is desired. Furthermore, environmentally conscious citizens can only be produced by competent teachers who are also environmentally conscious and who exhibit environmentally positive attitude. However, most previous studies only focused on environmental knowledge and attitudes of learners leaving those of the teachers who are conveyors of the knowledge. It becomes more critical when one observes that researchers have shown less focus on Agricultural Science. A study on environmental attitudes of Agricultural science is therefore desirable.

This work, therefore, sets out to assess the attitudes of teachers of Agricultural Science to environmental problems and issues. This is premised on the opinion of scholars that attitudes are shaped by, among other factors, experiences which, in turn, are activated in the presence of all objects and situations [Manyatsi 9]. Mlipha and Manyatsi [10] maintained that teachers, and even their students, may develop a particular attitude towards the environment which might have a bearing on the teaching/learning of environmental education in our schools (attitude shaping behaviour). This importance informed the need for the assessment of the environmental attitude of Agricultural Science teachers and likely factors influencing the attitude.

2. The Study

The study determined the environmental attitude of Agricultural Science teachers in Nigeria. Specifically,

- (i) it sought and obtained data on sources of environmental information available to Agricultural Science teachers.
- (ii) it also sought and obtained information on environmental attitudes of the respondents.
- (iii) it determined gender differences in the respondents' environmental attitude.
- (iv) it determined differences in the environmental attitude of the respondents due to years of teaching Agricultural Science.

3. Research questions

- i. What are the socio-demographic characteristics of the respondents?
- ii. What are the sources of information available to the respondents on environmental issues and problems?
- iii. What is the type of attitude exhibited by Agricultural Science teachers to environmental issues and problems?

4. Hypotheses

Ho₁: There is no significant gender difference in the attitude of Agricultural Science teachers to environmental issues and problems.

Ho₂: There is no significant difference in attitude to environmental issues and problems among Agricultural Science teachers, in terms of teaching experience in years.

5. Methodology

5.1. Research Design

The study adopted an *ex-post facto* design.

5.2. Population and Sampling Technique

The target population was all Agricultural Science teachers in Nigeria comprising of the six geo-political zones and Abuja (the Federal capital city). The sample is made up of 87 Agricultural Science teachers from all the zones present in a national workshop organized for Agricultural Science teachers by Science Teachers Association of Nigeria (STAN).

5.3. Instrumentation

The researcher-developed instrument used in the study is called Agricultural Science Teachers' Environmental Attitude Scale (ATEAS). It comprises of 17 statements, in a 5-point Likert scale format (Strongly Agree, Agree, Not Sure, Disagree, Strongly Disagree), drawn to measure the environmental attitude of the teachers. Nine of the statements are negatively worded while eight are positive statements. Points ranging from 5 to 1 are awarded for positive statements. This is reversed for negative statements. A Cronbach Alpha measure of 0.73 was obtained on the determination of the internal consistency of the items after face and content validation by two experts.

5.4. Instrument Administration

The instrument was personally administered by the researcher during a national workshop for Agricultural Science teachers.

6. Data Analysis

The data collected were analyzed using percentages, frequency counts, One-way ANOVA and t-test.

7. Results

7.1. 1. Research Question 1

What are the socio-demographic characteristics of the respondents?

i. Respondents Distribution according to Gender

Gender descriptive analysis is as follows:

Table 1. Distribution of Respondents according to Gender

Gender	Number	Percentage
Male	54	62
Female	33	38
Total	87	100

Table 1 shows that majority (62%) of the respondents are male while only 33% are female.

ii. Respondents' Distribution according to Years of Experience

An analysis was carried out to show the distribution of respondents in terms of their years of experience. The result is as follows:

Table 2. Distribution of Respondents According to Years of Experience

Experience in Years	Number	Percentage
1-5 years	25	29
6-10 years	27	31
11-15 years	17	20
16-20 years	14	16
21-25 years	3	3
26-30 years	1	1
Total	87	100

Table 2 above shows that years of experience of teachers are classified into 1-5, 6-10, 11-15, 16-20, 21-25 and 26-30, and are represented respectively in the following percentages: 29, 31, 20, 16, 3 and 1.

7.1. 2. Research Question 2

What are the sources of information available to the respondents on environmental issues and problems? To answer this question, simple frequency and percentage distribution are used. The result is presented in Table 3 that follows:

Table 3. Respondents' Sources of Information on Environmental Education

Sources	Number of Subjects	Percentage (%)
None	2	2.3
Newspaper/ Journals/ Magazines/ Textbooks only	12	13.8
Radio/Television only	25	28.7
Seminar only	2	2.3
Combination of Sources	45	51.7
Online Journal only	1	1.1
Blogs only	0	0.0
YouTube only	0	0.0
Webcasts only	0	0.0
Others only	0	0.0
Total	87	100

Table 3 shows that majority (51.7%) of the 87 respondents got environmental education information from different sources. This is followed by those who got their Environmental Education (EE) information from Radio and Television broadcasts (28.7%). Twelve of the respondents representing 13.8% indicated that they obtained EE information from print media such as newspapers, journals, magazines and textbooks only while only two respondents (2.3%) had attended seminars on environmental education. The same number representing 2.3% indicated that they did not obtain EE information from any particular source. One of the respondents got information on EE through the internet only. Indeed, none of those who claimed to have obtained information through a combination of sources mentioned the internet. It is therefore not surprising that none of the respondents claimed to have obtained EE information from internet-based sources such as blogs, You Tubes and Webcasts.

7.1.3. Research Question 3

What is the type of attitude exhibited by Agricultural Science teachers to environmental issues and problems? To answer this question, simple frequency, percentage distribution means and standard deviation are used. The result is presented in Table 4 that follows:

Table 4. Distribution of Subjects according to Responses to Agricultural Science Teachers' Environmental Attitude Scale (ATEAS)

		SA	A	NS	D	SD	Mean	StdDev	Remark
	I believe that:								
1	For industrialization to take place, large expanse of land covered with trees has to be cleared.	29 (33%)	25 (28.7%)	4 (4.6%)	14 (16.1%)	15 (17.2%)	2.55	1.515	-ve
2	Herbicides have no serious harmful effects on the environment.	2 (2.3%)	11 (12.6%)	2 (2.3%)	29 (33%)	43 (49.4%)	4.15	1.105	+ve
3	Food items should be packaged in disposable polythene bags instead of wrapping with leaves.	19 (21.8%)	29 (33%)	8 (9.2%)	21 (24.1%)	10 (8.7%)	2.70	1.356	-ve
4	There are serious environmental problems in Nigeria.	43 (49.4%)	29 (33%)	8 (9.2%)	2 (2.3%)	5 (5.7%)	4.18	1.084	+ve
5	Instead of expending so much effort on solving environmental problems, effort should first be directed at making Nigeria self-sufficient in food production.	5 (5.7%)	6 (6.9%)	2 (2.3%)	33 (37.9%)	41 (47.1%)	4.14	1.133	+ve
6	The production of "pure water" in sachets has many negative effects on the Nigerian environment.	18 (20.7%)	29 (33%)	9 (10.3%)	25 (28.7%)	6 (6.9%)	3.32	1.280	+ve
7	Pollution is not a necessary effect of mechanization.	7 (8.0%)	16 (18.4%)	3 (3.4%)	43 (49.4%)	18 (20.7%)	2.44	1.236	-ve
8	To ensure that weeds are controlled properly, clean clearing is necessary.	16 (18.4%)	33 (37.9%)	3 (3.4%)	27 (30.0%)	8 (9.2%)	2.75	1.323	-ve

9	Electro-fishing is an acceptable way of harvesting fish in areas where there is no possibility of electrocution of human beings.	10 (8.7%)	27 (30.0%)	10 (8.7%)	28 (32.2)	12 (13,8%)	3.06	1.288	+ve
10	Chemical fertilizers are only harmful when applied wrongly.	24 (27.6%)	43 (49.4%)	4 (4.6%)	12 (13,8%)	4 (4.6%)	2.18	1.126	-ve
11	Every Agricultural Science student must be environmentally knowledgeable.	56 (64.4%)	25 (28.7%)	1 (8.7%)	5 (5.7%)	0 (0.0%)	4.52	.790	+ve
12	Water from wells is not pure enough and must be purified before drinking.	38 (43.7%)	31 (35.6%)	5 (5.7%)	10 (8.7%)	3 (3.4%)	4.05	1.130	+ve
13	Bush burning, after dry season, is a necessary process before planting.	28 (32.2%)	30 (34.5%)	7 (8.1%)	14 (16.1%)	8 (9.2%)	2.36	1.329	-ve
14	There is nothing one can do to prevent noise pollution by roadside music operators.	14 (16.1%)	12 (13.8%)	3 (3.4%)	31 (35.6%)	27 (31.0%)	3.52	1.462	+ve
15	Mulching should be encouraged in the farm.	46 (52.9%)	27 (31.0%)	3 (3.4%)	3 (3.4%)	8 (9.2%)	4.15	1.234	+ve
16	Application of soluble fertilizer, mixed with irrigation water, should be preferred to using knapsack sprayers.	15 (17.2%)	28 (32.2)	14 (16.1%)	20 (17.4%)	10 (8.7%)	2.79	1.295	-ve
17	One of the ways of improving crop production is by clearing large area of virgin land and removing thick brush and trees to plant arable crops.	12 (13,8%)	28 (32.2%)	4 (4.6%)	28 (32.2%)	15 (17.2%)	3.07	1.379	+ve

Key: +ve = positive attitude, -ve = Negative attitude

Table 4 shows the environmental attitude of Agricultural Science teachers. Six of the 17 items are positively worded. These are items 4, 6, 7, 11, 12 and 15. Conversely 11 items, namely: 1, 2, 3, 5, 8, 9, 10, 13, 14, 16 and 17 are negatively worded. The scale was drawn in 5-Likert format of Strongly Agree (SA) to Strongly Disagree (SD). Reverse scoring was adopted for the negatively worded statements. The cut-off mark was put at 3.0. Mean scores that are less than 3.0 reflect negative environmental attitudes while those from 3.0 and above reflect positive attitudes. From table 4, positive attitudes are reflected in 10 items which is just about 59% of all the items. The items are: 2, 4, 5, 6, 9, 11, 12, 14, 15 and 17 while negative attitudes are expressed in 7 items, namely: 1, 3, 7, 8, 10, 13 and 16. This is just 41% of the total number of items. It can therefore be concluded that Agricultural Science teachers exhibit fairly positive attitude towards environmental problems and issues.

7.2. Hypotheses

Ho₁: There is no significant gender difference in the attitude of Agricultural Science teachers to environmental issues and problems.

To test this hypothesis, the t-test result is presented in Table 5 below.

Table 5. T-test Table of Analysis of Agricultural Science Teachers Environmental Attitude based on Gender

	Gender	N	\bar{X}	SD	t	df	P	2-tail Sig	Remark
Teachers' Environmental Attitude	Male	54	56.59	5.662	1.462	85	0.001	.147	Not Sig.
	Female	33	54.82	5.199					

Table 5 shows that male teachers have higher mean score ($\bar{X}=56.59$) in environmental attitude than their female colleagues ($\bar{X}=54.82$) but the difference is not significant ($t_{85}=1.462$, $p > .001$). The null hypothesis that there is no significant difference between the environmental attitude of male and female Agricultural Science teachers in Nigeria is therefore supported.

H_{02} : There is no significant difference in attitude to environmental issues and problems among Agricultural Science teachers in terms of their years of teaching.

To test this hypothesis, means and standard deviations of the attitude scores are presented in table 6 below:

Table 6. The Means and Standard Deviations of Agricultural Science Teachers Attitude to Environmental Issues and Problems in terms of Years of Teaching

Experience in years	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
1-5yrs	25	53.92	4.582	.916	52.03	55.81	45	61
6-10yrs	27	56.81	5.122	.986	54.79	58.84	49	70
11-15yrs	17	58.24	5.562	1.349	55.38	61.10	43	65
16-20yrs	14	54.71	6.832	1.826	50.77	58.66	47	68
21-25yrs	3	56.00	7.000	4.041	38.61	73.39	49	63
26-30yrs	1	59.00	59	59
Total	87	55.92	5.528	.593	54.74	57.10	43	70

Table 6 shows means and standard deviations of attitudinal scores of the groups in terms of their years of teaching Agricultural Science. The pattern seems to be that as the years of teaching increases, positive environmental attitude increases, until after 15 years when a sharp decrease is observed. This is again followed by a steady rise. To establish significance, One-way ANOVA table (Table 7) is presented below:

Table 7. Summary of One-way Analysis of Variance (ANOVA) Of Respondents' Attitude Scores In Terms of Years of Teaching

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	242.607	5	48.521	1.647	.157
Within Groups	2385.830	81	29.455		
Total	2628.437	86			

Table 7 establishes the fact that there is no significant difference in respondents' attitude to environmental issues and problems due to differences in their years of teaching ($F_{2, 57} = 1.647$, $p > .05$).

8. Discussion

The result as indicated by table 1 shows a fair representation of respondents, based on gender. Sixty-two percent of the respondents is male while only thirty-eight percent is female. There is a higher presence of male Agricultural Science teachers than their female colleagues. This is the common trend, since it is often believed that the subject requires rigour in its teaching because of the practical aspect. It is therefore considered as 'hard' science mainly for men while others, especially Biology, are 'soft' science for women.

Table 2 also shows what seems to be a fair representation of the distribution of Agricultural Science teachers in terms of years of teaching. As years go by, the number reduces for various reasons such as change of job, death, retirement, resignation *etc.*

Table 3 shows the sources of information that are available to Agricultural Science teachers. Only 2.3% of the 87 teachers did not signify a particular source. Also, 28% of them made references to Radio and Television (only) while 51.7% mentioned a combination of sources. It is surprising however to note that none of the respondents in this group mentioned seminar or on-line source among the various sources listed. It was just a combination of print and electronic media. Only 2.3% and 1.1% claimed to have attended seminars and accessed environmental information through on-line journals respectively. This is quite worrisome. It is a pointer to the possibility of poor attitude of government and other stakeholders to deliberate organization of sensitization and awareness programmes on environmental education on one hand, and poor attitude of Agricultural Science teachers to the utilization of the abundant resources on environmental education available on the internet. However, print and electronic media made a tremendous input into educating the teachers on environmental issues and problems.

Result, as shown in Table 4, shows a fairly positive attitude of Agricultural Science teachers to environmental issues and problems. This is not in tandem with the work of Mliphah and Manyasi [10] whose study revealed a high level of positive environmental attitude among science teachers. This result may not be unconnected with the low level of exposure of Agricultural Science teachers to environmental information through various sources as revealed in Table 3. Though, the relatively high level of inclusion of environmentally related concepts in Agricultural Science curriculum should have informed high positive environmental attitude among Agricultural Science teachers, but this is not so in this case. It can therefore be inferred that the inclusion of environmentally related concepts in subject curricula and their mastery are not enough to greatly influence teachers' environmental attitude. This position is supported by Wain, Rahman and Cem [22] who maintain that there is little predictive value for behaviour in the knowledge of environmental issues. They contend that an increase in environmental knowledge may not, in itself, influence behaviour. It can therefore be concluded that other factors may be contributory to the development of positive environmental attitudes. Further research needs to be carried out in this direction. The finding of this study also corroborates the conclusion of Wahida, Hamidi and Hussain [11] that 'the awareness towards environmental issues and awareness about the need to maintain the environment had increased among the society, but the level of individual involvement in the activities of environmental protection is still at low level'.

Specifically however, result of item 1 shows that Agricultural Science teachers seem to underestimate the benefits of maintaining a green environment. They also exhibit an underestimation of the level of environmental disruption and degradation caused by industries, especially where environmental regulations are either not in place or not effectively enforced, which is the case with Nigeria. Result of item 3 equally shows that environmental benefits of the cultural practice of wrapping food items like *Ámàlà* (solid food prepared from yam flour), *Iyán* (pounded yam prepared from freshly-boiled pieces), *Èḡko* (Solid-Maize pap), Rice *e.t.c.* in clean leaves of *Ewé'ran* (*Sarcophrynium*

brachystachys), a variety of *Yorùbá* soft cane and *Ewé-gbòdògì* (*Megaphrynium macrostachyum*), another variety of *Yorùbá* soft cane, are not well appreciated. It is however commendable that Agricultural Science teachers appreciate the environmental nuisance being caused by non-degradable wastes, especially 'pure water' polythene sachets and plastic bottles. 'Pure water' is a common name for packaged drinkable or table water. These materials can be seen everywhere in the country, blocking drains and causing other environmental hazards. Recycling of the materials has not been a priority either by the government or private industries. Nkiru, Chinwe and Philip [12] conclude, after a study on the effect of sachet wastes, that environmental problems of the disposal of these materials range from blockage of drainage systems, squirting water to soil clean clothes, blockage of ruminants' gastrointestinal tracts, soil infertility, pollution of ponds, littering of the environment to air pollution.

It is also surprising that the many of the respondents believed that pollution was a necessary effect of mechanization as expressed in item 8. This position is not in line with the effort to reduce industrial pollution by stakeholders. As teachers of Agricultural Science that are expected to teach the disadvantages of the use of chemical fertilizers, the belief by the majority that chemical fertilizers are only harmful when wrongly applied (as expressed in item 10) is worrisome. This position also positively correlates with the response of the majority to item 16 which shows a poor understanding of the level of damage done when soluble fertilizers are mixed with irrigation water, as a way of cutting the cost of application. One major environmental problem in Nigeria is that of noise pollution. However, many of the respondents appreciate this problem and are not carried away by the non-implementation of government policies in this respect as expressed in their responses to item 14. In all, efforts are still required to improve the environmental attitude of respondents, since the conclusion in this respect is that of fair positive attitude. A considerable improvement is desirable.

Table 5 reveals a non-significant gender difference in the environmental attitude of Agricultural Science teachers. It shows that although male teachers have higher mean score ($\bar{X}= 56.59$) in environmental attitude than their female colleagues ($\bar{X}=54.82$), the difference is not significant ($t_{85}= 1.462, p > .001$). This result seems quite different from the trend. Most studies conclude that females have more positive environmental attitude than males. The assumption of socialization theories that women are more nurturing is equally challenged with this result. For instance, Erol [13], Uzun and Sağlam [14] and Şama [15] conclude that female student teachers have more positive environmental attitudes than their male peers. However, the result of this study finds support in the work of Ibrahim and Babayemi [16] who affirm that insignificant differences are recorded across gender sub groups as regards attitudes towards environmentalism by a group of Nigerian undergraduates.

Again Ebong [17] concludes that there is no gender difference in the attitudes toward a sustainable environment among respondents in Akwa Ibom state of Nigeria. More importantly, however, is the conclusion of Mlipha and Manyatsi [10] that male teachers have a more positive attitude towards the environment than that of female teachers. Their work examined just the mean scores, and did not establish whether or not the difference is significant. In this study, a number of reasons can be adduced for the result in respect of gender. First is the general perception of Agricultural Science as a 'hard subject' (even among teachers), thus, most 'out of classroom' activities are pushed to male teachers. This also reflects in the fact that there are often more Agricultural Science male teachers than female. The dual personality of the female teacher can also be used to explain the result. At home, she spends so much time and effort managing the environment but in school, she classifies such work as work meant for male teachers and she takes the back seat. This is bound to affect her environmental attitude.

Following similar trend, results of this study (as shown in Tables 6 and 7) indicate a non-significant difference in environmental attitude between Agricultural Science

teachers due to their years of teaching. This implies that years of teaching did not bring about improved environmental attitude among Agricultural Science teachers and *vice versa*. It is interesting to note that repeated teaching of the environmental concepts by Agricultural Science teachers seems a mere mechanical exercise with little or no positive improvement in their personal environmental attitude. This finding is in contrast to the conclusions of Connell *et. al.*, [18], and Scott and Willits [19] that individuals possess better environmental attitudes when compared with their environmental knowledge. Similarly Kaiser, Sybille and Urs [20] also assert that factual knowledge about the environment is a precondition for one's environmental attitude. The result of this study challenges the claim by Ajiboye [21] that the attitude of an individual depends, to a large extent, on the knowledge he has about the object of affection. A contrary position is taken by Esa [22] who states that previous studies show that many students and teachers lack sufficient environmental knowledge but demonstrate positive attitudes towards the environment. The result of this study implies that further efforts should be directed at identifying other factors that are germane to the development of positive environmental attitude among Agricultural Science teachers.

9. Conclusion and Recommendations

The need for an environmentally conscious citizenry cannot be over-emphasized. It is therefore necessary to invest in the production of citizens that are knowledgeable and exhibit necessary positive attitudes to save the environment. Agricultural Science teachers can be veritable tools for positively inducing positive environmental attitudes among learners when they themselves exhibit such attitudes.

This study has shown that Agricultural Science teachers have fairly positive attitude towards environmental issues and problems. More efforts should therefore be put into identifying factors (apart from environmental knowledge) that influence development of positive environmental attitude. The study has also shown that teachers' gender and their teaching experience in term of years do not bring out significant differences between them.

It is therefore recommended that greater awareness should be created for Agricultural Science teachers through more environmental education seminars, workshops, conferences and both audio and video jingles in the mass media on the need for positive changes in environment. Aside this, more research should be carried out to determine factors that influence Agricultural Science environmental attitudes of teachers.

10. Contributions of this Paper to Literature:

- The study has provided an insight into the environmental attitudes of Agricultural Science teachers.
- It was also found out that years of teaching environmental concept may not lead to improved environmental attitudes.
- And that no significant gender difference exists in environmental attitudes of Agricultural Science teachers.

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Author



Dr. Rasheed Adekunle, holds a doctoral degree in science education from the University of Ibadan, Nigeria. His areas of specialization include Environmental Education, Agricultural Education and Ethnoscience. He is currently an adjunct lecturer with the National Open University of Nigeria, Lagos

